Remarks/Arguments

In the Final Office Action, the Examiner stated that claims 1-28 are pending in the application and that claims 1-28 stand rejected. None of the Applicant's claims have been amended by this response.

In view of the following discussion, the Applicant respectfully submits that none of these claims now pending in the application are rendered obvious under the provisions of 35 U.S.C. § 103. Thus, the Applicant believes that all of these claims are now in allowable form.

Rejections

A. 35 U.S.C. § 103

The Examiner rejected the Applicant's claims 1, 2, 7, 12, 13, 18, 19, 22, 25 and 26 under 35 U.S.C. § 103(a) as being unpatentable over AAPA (FIG. 1, paragraphs 002-006) in view of Yamaguchi, (U.S. Patent No. 5,796,852). The rejection is respectfully traversed.

The Applicant submits that the AAPA fails to teach, suggest or render obvious each and every element of at least the invention as recited in the Applicant's independent claim 1, which specifically recites:

> "A speaker system providing enhanced intelligibility of a reproduced audio program signal in the presence of ambient noise, comprising:
>
> 'means for receiving the reproduced audio program signal;
>
> 'a microphone for monitoring at least ambient noise signals and for providing a microphone output signal;
>
> 'means for enabling the microphone output signal during first increments of time when the reproduced audio program signal is substantially off, and disabling the microphone output signal during second increments of time when the reproduced audio program signal is on, such that the microphone output signal includes ambient noise signal components without including reproduced audio program signal components; and
>
> 'a signal processor, in communication with the means for receiving and the means for enabling/disabling for applying a first transfer function to the reproduced audio program signal, the first transfer function **incrementally increasing** gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output

signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal." (emphasis added).

In support of at least the Applicant's claim 1, the Applicant, in the Specification, initially discusses the deficiencies of the prior art. More specifically, the Applicant in the Specification, specifically recites:

"Such conventional speaker systems provide amplitude compensation linearly and directly as a function of the changing ambient noise. This linear compensation is a transfer function f_1 expressed by the equation $f_1(S_{an}) = (S_{in} \times S_{an})$, where S_{in} is the program input signal amplitude and S_{an} is the ambient noise signal amplitude. However, the above linear transfer function is non-optimal for at least retail store and other commercial environments, which commonly exhibit frequent and widely varying changes in ambient noise, since the conventionally compensated speaker output signal provides commensurately frequent and widely varying changes in sound levels that can be annoying to listeners. Thus, what is needed is a speaker system providing direct, but incremental, amplitude compensation as a function of f_i of such frequent and widely varying changes in ambient noise." (See Specification, para. 0006).

As clearly evident from at least the portion of the Applicant's Specification presented above, the Applicant's invention is directed, at least in part, to addressing the deficiencies of the prior art linear transfer functions that provide commensurately frequent and widely varying changes in sound levels that can be annoying to listeners. The Applicant teaches that various embodiments of the Applicant's invention are directed to providing a method and speaker system providing direct, but **incremental**, amplitude compensation for addressing the deficiencies of the prior art.

In support of at least the Applicant's claim 1, the Applicant in the Specification further recites:

"An embodiment of the present invention is a commercial speaker system that receives an input audio program signal. The input audio program signal can be from any source, such as a CD, DVD, MPEG, tape, live broadcast, etc., and can consists a mono-signal or of summed left and right stereo signals. The speaker system of this embodiment can comprise a signal process and transfer function for enhancing the intelligibility of the reproduced program signal in the presence of widely varying ambient noise levels over discrete time increments. Such a transfer function can

> incrementally vary the volume of the reproduced sound, for example in steps of about 1 dB to about 10 dB, directly as a function of the volume of ambient noise, whereby such incremental variations ensure that the volume of the reproduced sound does not change too frequently as a consequence of rapidly occurring changes in the ambient noise." (See Specification, para. 00016).

And

> "As shown in FIG. 2, the program input signal S_{in} is applied to signal input s of signal process P_2. P_2 output port o provides signal process output signal S5. P_2 introduces transfer function f_2 providing incrementally increasing gain, for example, in steps of about 1 dB to about 10 dB, to S_{in} as a function of increasing amplitude of a signal process control signal, and vice versa, described below. This transfer function f_2 can, for example, be a non-linear equation of the form $f_2(S_{an}) = (S_{in} \times S_{anl})$, where S_{anl} is the ambient noise signal amplitude in increments of, for example, about 1 dB to about 10 dB." (See Specification, para. 00018).

As clearly evident from at least the portions of the Applicant's Specification presented above, in the invention of the Applicant, gain is provided incrementally as function of increasing amplitude of a signal process control signal and not linearly as taught in the prior art. That is, the Applicant's teach that, in accordance with the present invention, a transfer function can incrementally vary the volume of the reproduced sound incrementally as a function of the volume of ambient noise, whereby such incremental variations ensure that the volume of the reproduced sound does not change too frequently as a consequence of rapidly occurring changes in the ambient noise.

In contrast to the invention of the Applicant, the AAPA cited by the Applicant teaches providing amplitude compensation linearly and directly as a function of the changing ambient noise, which commonly exhibit frequent and widely varying changes in ambient noise, since the conventionally compensated speaker output signal provides commensurately frequent and widely varying changes in sound levels that can be annoying to listeners. That is, the Applicant submits that there is absolutely no teaching, suggestion or disclosure in the AAPA for at least "the first transfer function **incrementally increasing** gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal" as taught in the Applicant's Specification and as claimed by at least

the Applicant's claim 1. In fact, the Examiner concedes that the AAPA fails to teach or suggest incrementally increasing gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal" as taught in the Applicant's Specification and as claimed by at least the Applicant's claim 1. As such, the Examiner cited Yamaguchi for attempting to teach "the first transfer function **incrementally increasing** gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal" as taught in the Applicant's Specification and as claimed by at least the Applicant's claim 1.

The Applicant submits that the teachings of Yamaguchi absolutely fail to bridge the substantial gap between the teachings of the AAPA and the invention of the Applicant. More specifically, Yamaguchi teaches a method of and apparatus for electronic volume control of audio signals. The problem solved by the invention of Yamaguchi is the reduction of switching noise generated when an audio signal envelope is abruptly changed. That is, Yamaguchi teaches that when an audio signal envelope is abruptly changed an audio signal volume is gradually increased or decreased to reduce switching noise. Such teachings of Yamaguchi fail to address the deficiencies of the prior art to which various embodiments of the Applicant's invention are directed.

More specifically, the Applicant teaches that conventional speaker systems provide amplitude compensation linearly and directly as a function of the changing ambient noise. The Applicant further teaches that such linear compensation is non-optimal for at least retail store and other commercial environments, which commonly exhibit frequent and widely varying changes in ambient noise, since the conventionally compensated speaker output signal provides commensurately frequent and widely varying changes in sound levels that can be annoying to listeners. As such, the Applicant teaches and claims a speaker system providing direct, but incremental, amplitude compensation as a function of such frequent and widely varying changes in ambient noise to provide a more pleasant listening

experience and for enhancing the intelligibility of the reproduced program signal in the presence of widely varying ambient noise levels over discrete time increments.

More specifically, the Applicant teaches and claims a transfer function which can incrementally vary the volume of the reproduced sound, for example in steps of about 1 dB to about 10 dB, directly as a function of the volume of ambient noise, whereby such incremental variations ensure that the volume of the reproduced sound does not change too frequently as a consequence of rapidly occurring changes in the ambient noise.

In contrast to the invention of the Applicant, Yamaguchi teaches a slow response to abrupt audio signal envelope changes. The Applicant submits that such a slow response fails to produce the claimed result of the Applicant's invention which is to enhance the intelligibility of a reproduced program signal in the presence of widely varying ambient noise levels by increasing and decreasing the audio levels of, for example, a speaker in response to such ambient noise level changes. That is, in the invention of the Applicant, audio signal level outputs of, for example, a speaker are increased when ambient noise levels increase and are decreased when ambient noise levels increase. With a slow response as taught in Yamaguchi, the audio signal level changes would lag and could result in loud output audio signal levels during low ambient noise periods and low output audio signal levels during loud ambient noise periods. That is, with a slow audio response as taught and claimed by Yamaguchi, audio information could often be lost due to rapidly changing ambient noise levels such as in retail stores and other commercial environments. Thus, the invention of Yamaguchi would fail to produce the desired result of the Applicant's claimed invention and absolutely fails to teach at least "the first transfer function **incrementally increasing** gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal" as taught in the Applicant's Specification and as claimed by at least the Applicant's claim 1.

For at least the reasons recited above, the Applicant submits that the teachings of Yamaguchi absolutely fail to teach or suggest the invention of the Applicant and actually teaches away from the invention of the Applicant in which a

rapid response is needed to ambient noise level changes and specifically for at least one transfer function in which "the first transfer function **incrementally increasing** gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal" as taught in the Applicant's Specification and as claimed by at least the Applicant's claim 1.

Therefore, the Applicant submits that, for at least the reasons recited above, the AAPA and Yamaguchi, alone or in any allowable combination, absolutely fail to teach, suggest or render obvious at least the Applicant's independent claim 1. As such, the Applicant respectfully submits that the Applicant's claim 1 fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

Likewise, the Applicant's independent claims 7, 12, 18, 22 and 25 recite similar relevant features as the Applicant's amended claim 1. Therefore, the Applicant submits that at least for the reasons recited above with respect to independent claim 1, the Applicant's independent claims 7, 12, 18, 22 and 25 are also not rendered obvious by the teachings of the AAPA and Yamaguchi, alone or in any allowable combination, and as such fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

Furthermore, dependent claims 2, 13, 19 and 26 depend directly from independent claims 1, 12, 18 and 25 and recite additional features therefor. As such and for at least the reasons set forth herein, the Applicant submits that dependent claims 2, 13, 19 and 26 are also not rendered obvious by the AAPA and Yamaguchi, alone or in any allowable combination. Therefore the Applicant submits that dependent claims 2, 13, 19 and 26 also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

B. 35 U.S.C. § 103

The Examiner rejected the Applicant's claims 3, 5, 8, 10, 14, 16, 20-21, 23-24 and 27-28 under 35 U.S.C. § 103(a) as being unpatentable over the AAPA and Yamaguchi as applied to claims 1, 7, 12, 18, 22 and 25 in view of Bosnak (U.S. Patent No. 4,554,533). The rejection is respectfully traversed.

The Examiner applied the AAPA and Yamaguchi for the rejection of claims 3, 5, 8, 10, 14, 16, 20-21, 23-24 and 27-28 as applied above for the rejection of the Applicant's claims 1, 7, 12, 18, 22 and 25. As described above and for at least the reasons described above, the Applicant respectfully submits that the AAPA and Yamaguchi, alone or in any allowable combination, absolutely fail to teach, suggest or make obvious at least the Applicant's claims 1, 7, 12, 18, 22 and 25. The Applicant further submits that at least because the AAPA and Yamaguchi, alone or in any allowable combination, absolutely fail to teach, suggest or make obvious at least the Applicant's independent claims 1, 7, 12, 18, 22 and 25, the AAPA and Yamaguchi, alone or in any allowable combination, also fail to teach, suggest or make obvious at least the Applicant's claims 3, 5, 8, 10, 14, 16, 20-21, 23-24 and 27-28, which depend either directly or indirectly from the Applicant's independent claims 1, 7, 12, 18, 22 and 25.

The Applicant further submits that the teachings of Bosnak absolutely fail to bridge the substantial gap between the AAPA and Yamaguchi and the invention of the Applicant. More specifically, Bosnak teaches a method of and apparatus for the testing of warning systems. In Bosnak, the operational status of a remotely controlled electronic siren is periodically tested, from a command post, without producing audible sound. The test procedure includes energizing the voice coils of the siren loudspeakers with a signal outside of the audible range, sensing whether current flows in the speaker voice coil circuits and storing the results of the test. The stored information, upon request, will be transmitted back to the command post. (See Bosnak, Abstract). However, the Applicant respectfully submits that there is absolutely no teaching or suggestion in Bosnak for a method and speaker system including at least "the first transfer function **incrementally increasing** gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing

amplitude of the microphone output signal" as taught in the Applicant's Specification and as claimed by at least the Applicant's claim 1.

In fact, the Examiner only cites Bosnak for teaching a first amplifier having an input and an output, the first amplifier input coupled to the signal process output signal of the signal process and the first amplifier output coupled to a first speaker input of a first speaker.

The Applicant further submits that there is absolutely no motivation for the combination of the AAPA and Bosnak and that the AAPA and Bosnak are in two totally unrelated fields and teach two totally unrelated solutions to two totally unrelated problems.

Therefore, the Applicant submits that, for at least the reasons recited above, the AAPA, Yamaguchi and Bosnak, alone or in any allowable combination, absolutely fail to teach, suggest or render obvious at least the Applicant's independent claims 1, 7, 12, 18, 22 and 25. As such, the Applicant submits that at least because the AAPA, Yamaguchi and Bosnak, alone or in any allowable combination, fail to teach, suggest or render obvious the Applicant's claims 1, 7, 12, 18, 22 and 25, the AAPA, Yamaguchi and Bosnak, alone or in any allowable combination, also fail to teach, suggest or render obvious the Applicant's claims 3, 5, 8, 10, 14, 16, 20-21, 23-24 and 27-28, which depend either directly or indirectly from the Applicant's claims 1, 7, 12, 18, 22 and 25 and recite further features thereof. As such, the Applicant respectfully submits that the Applicant's claims 1, 7, 12, 18, 22 and 25 fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

C. 35 U.S.C. § 103

The Examiner rejected the Applicant's claims 4, 6, 9, 11, 15 and 17 under 35 U.S.C. § 103(a) as being unpatentable over the AAPA, Yamaguchi and Bosnak as applied to claim 3 and in further view of Tanaka et al. (U.S. Patent No. 5,588,065, hereinafter "Tanaka"). The rejection is respectfully traversed.

The Examiner applied the AAPA, Yamaguchi and Bosnak for the rejection of claims 4, 6, 9, 11, 15 and 17 as applied above for the rejection of the Applicant's

claim 3. As described above and for at least the reasons described above, the Applicant respectfully submits that the AAPA, Yamaguchi and Bosnak, alone or in any allowable combination, absolutely fail to teach, suggest or make obvious at least the Applicant's claim 3. The Applicant further submits that at least because the AAPA, Yamaguchi and Bosnak, alone or in any allowable combination, absolutely fail to teach, suggest or make obvious at least the Applicant's claim 3, the AAPA, Yamaguchi and Bosnak also fail to teach, suggest or make obvious at least the Applicant's claims 4, 6, 9, 11, 15 and 17.

The Applicant further submits that the teachings of Tanaka absolutely fail to bridge the substantial gap between the teachings of the AAPA, Yamaguchi and Bosnak and the invention of the Applicant. More specifically, Tanaka teaches a bass reproduction speaker apparatus. In Tanaka, a bass reproduction speaker apparatus includes: a cabinet with an opening, having a division member inside thereof; a speaker unit disposed at the division member; a passive radiator disposed in the opening; an amplifier for driving the speaker unit; a detector for detecting a vibration of a moving system of the speaker unit; and a feedback circuit for feeding back an output signal from the detector to the amplifier. (See Tanaka, Abstract). However, the Applicant respectfully submits that there is absolutely no teaching or suggestion in Tanaka for a method and speaker system including at least "the first transfer function **incrementally increasing** gain adjustments to the reproduced audio program signal as a function of an increasing amplitude of the microphone output signal, and **incrementally decreasing** gain adjustments to the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal" as taught in the Applicant's Specification and as claimed by at least the Applicant's claim 1. In fact, the Examiner only cites Tanaka for teaching a speaker having a single speaker driver having a diaphragm diameter not greater than about 100 centimeters.

The Applicant further submits that there is absolutely no motivation for the combination of the AAPA, Yamaguchi, Bosnak and Tanaka and that the AAPA, Yamaguchi, Bosnak and Tanaka are in totally unrelated fields and teach totally unrelated solutions to totally unrelated problems.

Therefore, the Applicant submits that, for at least the reasons recited above, the AAPA, Yamagcuhi, Bosnak and Tanaka, alone or in any allowable

combination, absolutely fail to teach, suggest or render obvious at least the Applicant's claims 1 and 3. As such, the Applicant submits that at least because the AAPA, Yamaguchi, Bosnak and Tanaka, alone or in any allowable combination, fail to teach, suggest or render obvious the Applicant's independent claims as described above, the AAPA, Yamaguchi, Bosnak and Tanaka, alone or in any allowable combination, also fail to teach, suggest or render obvious the Applicant's claims 4, 6, 9, 11, 15 and 17, which depend either directly or indirectly from the Applicant's independent claims. As such, the Applicant respectfully submits that the Applicant's claims 4, 6, 9, 11, 15 and 17 fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

Conclusion

Thus, the Applicant submits that none of the claims, presently in the application, are rendered obvious under the provisions of 35 U.S.C. § 103. Consequently, the Applicant believes that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion, it is respectfully requested that the Examiner telephone the undersigned.

Please charge the $130.00 fee for the One Month Extension, and any other costs that may be due, to Deposit Account No. 07-0832.

Respectfully submitted,
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